ADOT Corridor Profile Studies (I-17, I-19, I-40)
Technical Advisory Committee (TAC)
DRAFT Meeting Summary
February 25, 2015

1. Welcome and Introductions

Heidi Yaqub (ADOT) opened the meeting, welcomed the attendees, and initiated the self-introductions. The sign-in sheet is attached which also notes individuals participating by telephone.

These studies are the first three in a series of nine Corridor Profile Studies. These studies will develop a new process and tools for performance based planning to identify needs and prioritize projects on strategic corridors in Arizona.

2. Project Status Update

Since the last TAC meeting in September 2014, the development of the Corridor Performance System has been completed (in coordination with ADOT Groups) and has been implemented on all three corridors. The completion of this task culminated with Working Paper #2 which was distributed on 2/11/15. Comments on WP#2 are due on 2/27/15.

The Corridor Vision was also developed for each corridor which included the identification of corridor performance objectives. The completion of this task culminated with Working Paper #3 which was distributed on 2/24/15. Comments on WP#3 are due on 3/13/15.

Following the submission of WP#2 and WP#3, the development of the approach to the Needs Assessment was initiated.

A project web site has also been created which is available at the following address: http://azdot.gov/planning/CurrentStudies/corridor-profile-studies

3. Corridor Performance System

A collaborative process involving ADOT MPD management, the ADOT MPD project managers, and the consultant study teams has been used to develop a Performance System. The development of the system included coordination with various ADOT groups to provide detailed information on performance measures and how each was calculated.

The Performance System will allow the assessment of corridor health through a performance based system that can be applied uniformly across multiple corridors and allow the comparison of corridor performance.

The system included five performance areas: Pavement, Bridge, Mobility, Safety and Freight. Each performance area includes both primary measures and secondary measures which are quantitative. All

measures are based on data which is readily available from ADOT. The primary measures have been titled the Pavement Index, Bridge Index, Mobility Index, Safety Index, and Freight Index. Each index is a single number that is a combination of both directions of travel. Each performance area contains a number of secondary measures. A three-level scale was developed to characterize each the results of each performance measure as either Good, Fair, or Poor (or Above Average, Average, Below Average).

The Performance System has been applied to each corridor. A summary of the performance results for each corridor is included the attachments.

- Question/Comment: How is feedback from the ADOT Districts being used/applied to the Performance System? Response: The results of the Performance System were presented to each District and we did receive feedback which most teams documented in WP#2. The results of the Performance System were generally supported by the Districts but some of the performance did not match the District's perspectives.

4. Corridor Vision and Objectives

In collaboration with the MPOs, COGs, and ADOT Districts, each study team developed a Corridor Vision and Performance Objectives. The Vision is intended to summarize the context and function of the corridor. The Performance Objectives were tied to the ADOT statewide goals shown in the LRTP. In addition, emphasis areas were identified for each corridor that will have elevated performance objectives for the corridor-wide (not segment) averages.

A summary of the Corridor Vision and Performance Objectives for each corridor are included the attachments.

- Question/Comment: Is the bridge performance objective for I-40 realistic? Response: Likely not in the short-tem, but could be a long-range goal.
- Question/Comment: Can/will the Emphasis Areas and Performance Objectives be updated? Response: It is anticipated that they will be updated generally every 5 years in conjunction with LRTP and corridor profile study updates.
- Question/Comment: Reliability on I-17 for business travel between Flagstaff and Phoenix/Sky Harbor (that occurs on generally regular intervals) needs to be reflected in Corridor Vision. Response: This can be addressed in the Final Report.
- Question/Comment: Vetting of Corridor Vision doesn't seem to be very comprehensive. Response: It is anticipated that other public outreach efforts will be conducted with updates to the LRTP.

5. Needs Assessment

The Needs Assessment will be based on the results of the Performance System and will be a multi-step process with the goal of identifying contributing factors to each Need. The initial step will be to identify performance deficiencies based on a mathematical comparison of the baseline performance to the

performance objectives. Once the performance deficiencies have been confirmed/verified and have been deemed actionable (can be address by an ADOT project, policy, or strategy), they will be identified as Needs. A flow-chart describing the approach to the Needs Assessment is included in the attachments. An example of Step 1 (Initial Deficiency Identification) and Step 2 (Deficiency Refinement) for the I-40 Pavement Performance Area is also included in the attachments.

- Question/Comment: Please describe "actionable". Response: A deficiency or need that can be addressed by an ADOT project, policy, or strategy.
- Question/Comment: How/when do "strategic" solutions and risk assessment come into play? Response: MAP-21 targets will need to be set (by ADOT) to compare corridors across the state. Potential solutions will be evaluated by life-cycle cost analysis and a risk assessment later in the process.
- Question/Comment: How do other goals in the LRTP fit in this system? Response: Economic vitality and environmental stewardship are considered in the P2P process.

6. Next Steps

The next steps for the Corridor Profile Studies include the following:

- Receive and address review comments on WP#2 and WP#3
- Perform Needs Assessment and distribute WP#4
- Conduct workshops to discuss the Needs Assessment and brain-storm potential Solution Sets

7. Adjourn

P2P Corridor Profile Studies
Technical Advisory Committee (TAC)
Meeting Agenda
February 25, 2015

Meeting Goal – Provide an update on the results of the Performance System, development of Corridor Vision and Objectives, and introduce the approach to Needs Assessment.

I. **Project Status Update** (AECOM)
   A. Performance System
   B. Vision and Objectives
   C. Working Paper #2 and #3
   D. Project Web Site

II. **Corridor Performance System**
   A. Overview (AECOM)
   B. Summary of I-17 Results (AECOM)
   C. Summary of I-40 Results (KHA)
   D. Summary of I-19 Results (legacy URS)

III. **Corridor Vision and Objectives**
   A. Overview (legacy URS)
   B. I-19 Vision and Objectives (legacy URS)
   C. I-17 Vision and Objectives (AECOM)
   D. I-40 Vision and Objectives (KHA)

IV. **Needs Assessment**
   A. Overview (KHA)
   B. Examples for I-40 (KHA)

V. **Next Steps** (KHA)
   A. Working Paper #2 and #3 review
   B. Distribute Working Paper #4
   C. Solution Set development

Corridor Profile Study Technical Advisory Committee (February 25, 2015)

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ADOT MPD CORRIDOR PROFILE STUDIES (I-17, I-19, I-40)

Technical Advisory Committee (TAC) Meeting #2

Wednesday, February 25, 2015

10:00 A.M. – Noon

Agenda

- Project Status Update
- Results of Corridor Performance System
- Corridor Visions and Objectives
- Needs Assessment
- Next Steps

Project Status Update

- Development of Performance System
- Implementation of Performance System
- Coordination with ADOT Groups
- Development of Corridor Visions and Objectives
- Initiated Approach to Needs Assessment
- Working Paper #2 (Corridor Performance) - Submitted
- Working Paper #3 (Corridor Vision) – Submitted
- Created Project Web Site

  http://azdot.gov/planning/CurrentStudies/corridor-profile-studies

Corridor Performance System

- Assess corridor health through a performance-based system
- Apply uniformly across multiple corridors
- Allow comparison of corridors
- Identify locations that warrant further investigation

Corridor Performance System

Performance Area	Primary Measure	Secondary Measures
Pavement	Pavement Index (based on a combination of International Roughness Index and Cracking)	• Pavement Serviceability • Pavement Failure • Pavement Hot Spots
Bridge	Bridge Index (based on Deck Rating, Substructure Rating, or Superstructure Rating)	• Sufficiency Rating • Functionally Obsolete • Bridge Hot Spots
Mobility	Mobility Index (based on combination of Current V/C and Future V/C)	• Current Volume/Capacity • Future Volume/Capacity • Travel Time Index (TTI) • Planning Time Index (PTI) • Road Closure Frequency • Multimodal Opportunities
Safety	Safety Index (based on frequency of fatal and incapacitating injury crashes)	• Frequency of Strategic Highway Safety Plan Emphasis Areas • Frequency of Truck Crashes • Frequency of Motorcycle Crashes • Safety Hot Spots
Freight	Freight Index (based on Truck Planning Time Index)	• Truck Travel Time Index (TTTI) • Truck Planning Time Index (TPTI) • Road Closure Duration • Clearance Restrictions

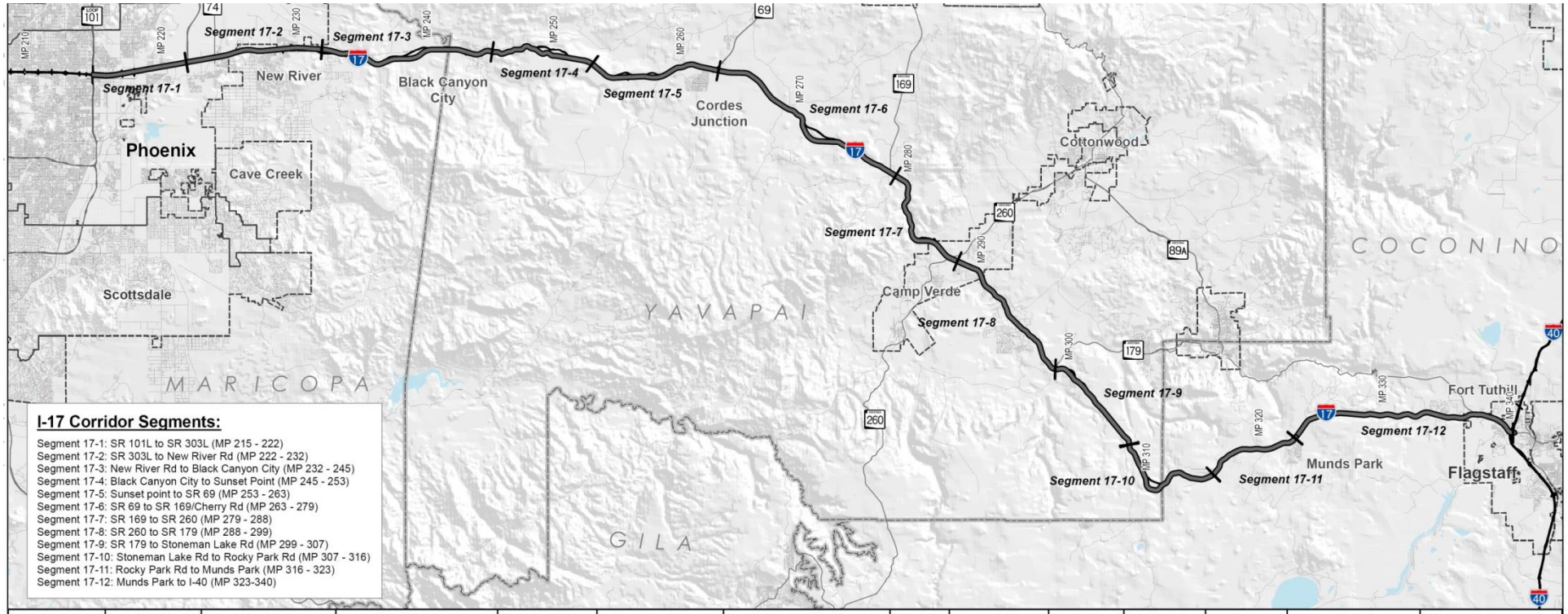
Three-Level Performance Scale

Good

Fair

Poor

I-17 Corridor Performance Summary



	17-1	17-2	17-3	17-4	17-5	17-6	17-7	17-8	17-9	17-10	17-11	17-12	Weighted Average
Pavement	4.19	4.16	3.85	4.25	4.25	4.26	3.92	4.32	4.21	4.19	3.73	3.70	4.07
Bridge	6.76	6.79	6.39	5.71	7.25	6.19	6.31	6.04	6.00	6.52	6.91	5.80	6.34
Mobility	0.75	0.57	0.85	0.87	0.86	0.51	0.78	0.53	0.53	0.43	0.36	0.36	0.60
Safety	0.83	0.77	1.20	0.88	0.94	1.37	1.10	0.71	0.48	1.24	0.87	1.80	1.09
Freight	0.94	0.95	0.94	0.67	0.88	0.74	0.75	0.88	0.75	0.74	0.94	0.93	0.85

I-17 Corridor Study: MP 215 to 340
Performance Index Summary

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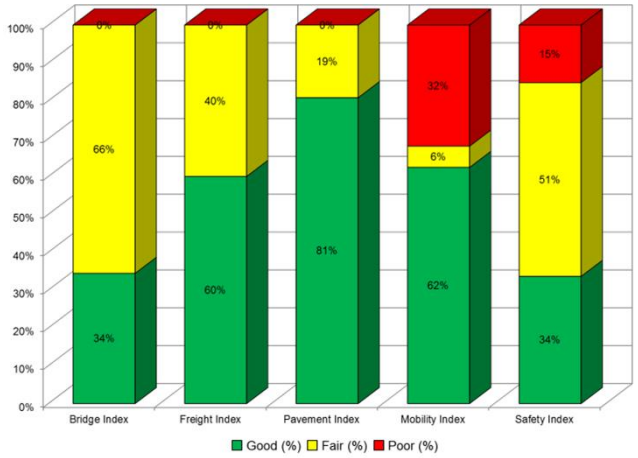
Performance Index Scale

	Pavement	Bridge	Mobility	Safety	Freight
Above Average, Good	> 3.75	> 6.5	< 0.71 (0.56)	> 1.24	> 0.77
Average, Fair	3.2 - 3.75	5.0 - 6.5	0.71 - 0.89 (0.56 - 0.76)	0.76 - 1.24	0.67 - 0.77
Below Average, Poor	< 3.2	< 5.0	> 0.89 (0.76)	< 0.76	< 0.67

Urban (Rural)

Corridor Segment
US Hwy/State Route
County Boundary
City Boundary

I-17 Corridor Performance Summary



Index Level Summary

% of corridor in each category

		Bridge Performance Area			Pavement Performance Area				Mobility Performance Area									Safety Performance Area				Freight Performance Area				
Segment	Length (Miles)	Bridge Index	Bridge Sufficiency	% Bridge Functionally Obsolete	Pavement Index	Directional PSR NB	Directional PSR SB	% Area Failure	Mobility Index	Future Daily V/C	Existing Peak Hour V/C NB	Existing Peak Hour V/C SB	Closure Extent (occurrences/year/mile) NB	Closure Extent (occurrences/year/mile) SB	Directional TTI (all vehicles) NB	Directional TTI (all vehicles) SB	Directional PTI (all vehicles) NB	Directional PTI (all vehicles) SB	% Non-Single Occupancy Vehicle (SOV) Opportunities	Safety Index	% of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors	% of Fatal + Incapacitating Injury Crashes Involving Trucks	% of Fatal + Incapacitating Injury Crashes Involving Motorcycles	Freight Index	Directional TTI (trucks only) NB	Directional TTI (trucks only) SB	Directional PTI (trucks only) NB	Directional PTI (trucks only) SB	Closure Duration (hours/mile/year)
17-1	7	6.76	90.95	31.1%	4.19	4.24	4.14	0.0%	0.75	0.91	0.65	0.62	0.99	0.85	1.00	1.00	1.03	1.03	10.7%	0.83	0%	0%	0%	0.94	1.03	1.03	1.07	1.07	14.2
17-2	10	6.79	92.73	14.6%	4.16	4.13	4.15	0.0%	0.57	0.67	0.57	0.55	0.34	0.50	1.07	1.04	1.15	1.11	12.3%	0.77	31%	6%	6%	0.95	1.02	1.00	1.06	1.04	5.9
17-3	13	6.39	91.10	31.3%	3.85	3.92	3.86	3.8%	0.85	1.04	0.56	0.54	0.65	0.25	1.09	1.11	1.17	1.20	12.0%	1.20	69%	10%	14%	0.94	1.01	1.03	1.04	1.09	3.1
17-4	8	5.71	93.97	60.9%	4.25	3.65	4.25	0.0%	0.87	1.07	0.50	0.55	0.25	0.93	1.21	1.00	1.61	1.07	12.3%	0.88	35%	6%	18%	0.67	1.34	1.07	1.81	1.16	8.4
17-5	10	7.25	96.41	15.0%	4.25	4.09	4.02	0.0%	0.86	1.06	0.58	0.57	1.19	1.24	1.20	1.14	1.34	1.21	15.5%	0.94	35%	10%	10%	0.88	1.09	1.02	1.20	1.07	12.9
17-6	16	6.19	94.82	8.5%	4.26	4.08	4.02	0.0%	0.51	0.63	0.37	0.36	0.21	0.41	1.13	1.38	1.23	1.69	7.7%	1.37	56%	6%	17%	0.74	1.03	1.27	1.08	1.61	5.3
17-7	9	6.31	91.41	0.0%	3.92	3.78	3.93	16.7%	0.78	0.96	0.66	0.63	3.21	3.52	1.23	1.15	1.27	1.31	7.7%	1.10	47%	7%	13%	0.75	1.07	1.27	1.15	1.52	99.6
17-8	11	6.04	89.20	13.6%	4.32	4.01	4.17	4.5%	0.53	0.63	0.42	0.43	0.31	0.20	1.14	1.13	1.27	1.24	14.1%	0.71	58%	21%	5%	0.88	1.08	1.05	1.15	1.11	2.4
17-9	8	6.00	93.00	100.0%	4.21	3.77	4.18	18.8%	0.53	0.63	0.30	0.36	2.20	1.60	1.30	1.12	1.61	1.22	6.6%	0.48	48%	10%	0%	0.75	1.29	1.06	1.55	1.13	24.6
17-10	9	6.52	94.00	100.0%	4.19	4.01	4.06	0.0%	0.43	0.51	0.25	0.28	2.30	1.68	1.29	1.13	1.60	1.25	6.3%	1.24	50%	20%	0%	0.74	1.25	1.07	1.57	1.15	24.3
17-11	7	6.91	96.48	3.4%	3.73	3.50	3.82	21.4%	0.36	0.43	0.23	0.26	1.71	1.43	1.10	1.08	1.18	1.16	6.2%	0.87	29%	7%	7%	0.94	1.03	1.02	1.07	1.06	23.9
17-12	17	5.80	92.00	62.3%	3.70	3.49	3.82	25.7%	0.36	0.44	0.23	0.28	1.68	1.37	1.05	1.04	1.13	1.11	17.9%	1.80	33%	4%	8%	0.93	1.05	1.03	1.10	1.06	21.4
Weighted Average	125	6.34			4.07				0.60											1.09				0.85					
Good		> 6.5	> 80	< 15	> 3.75	> 3.75		< 5	< 0.71 (0.56)				< 0.26		< 1.15		< 1.3		≥ 17%	> 1.24	<35% (44%)	<2% (11%)	<9% (5%)	> 0.77	< 1.15		< 1.3		< 0.8
Fair		5.0 - 6.5	50 - 80	15 - 45	3.2 - 3.75	3.2 - 3.75		5 - 20	0.71 - 0.89 (0.56 - 0.76)				0.26 - 1.53		1.15 - 1.33		1.3 - 1.5		11 - 17%	0.76 - 1.24	25%-55% (44%-51%)	2%-6% (11%-16%)	9%-19% (5%-10%)	0.67 - 0.77	1.15 - 1.33		1.3 - 1.5		0.8 - 18.6
Poor		< 5.0	< 50	> 45	< 3.2	< 3.2		> 20	> 0.89 (0.76)				> 1.53		> 1.33		> 1.5		< 11%	< 0.76	>55% (51%)	>6% (16%)	>19% (10%)	< 0.67	> 1.33		> 1.5		> 18.6
									Urban (Rural)											Urban (Rural)									

I-17 Corridor Performance Summary

Bridges & Pavement

- Generally in “good” or “fair” condition with the exception of a few isolated locations

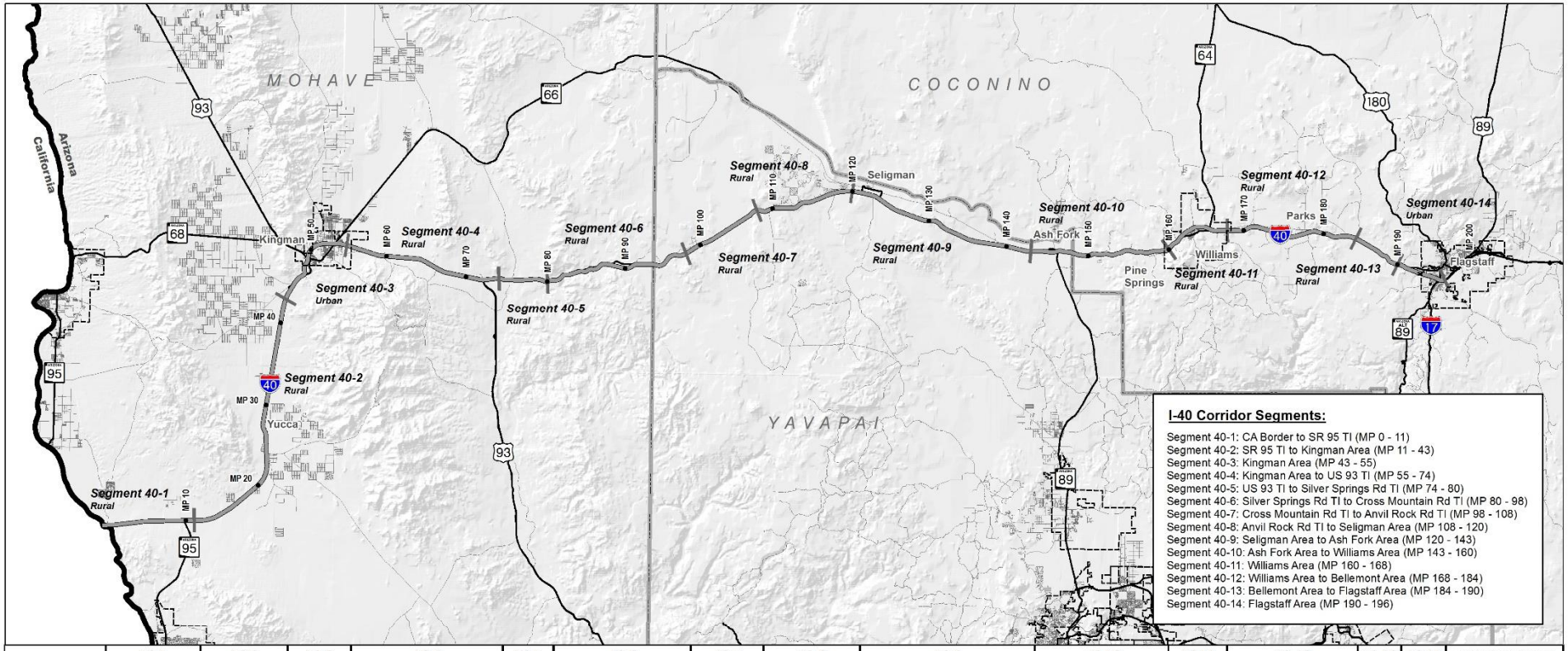
Mobility & Freight

- Currently “good” but projected traffic growth is expected to result in “poor” performance in approximately 40% of the corridor by the year 2035
- Closures along the corridor generally exceed the statewide average for both the closure frequency and duration

Safety

- Majority of the segments perform either “fair” or “poor” in the Safety Index
- Several locations of high crash frequency, including 4 segments in the northbound direction, and 9 segments in the southbound direction

I-40 Corridor Performance Summary



	40-1	40-2	40-3	40-4	40-5	40-6	40-7	40-8	40-9	40-10	40-11	40-12	40-13	40-14	Weighted Average
Pavement	4.10	4.38	4.11	3.20	3.64	3.22	3.56	4.09	4.27	3.64	3.26	3.60	2.85	3.74	3.79
Bridge	3.66	5.62	5.84	5.59	5.13	5.36	6.72	5.71	5.21	5.37	5.81	5.27	5.50	5.11	5.43
Mobility	0.43	0.37	0.55	0.56	0.44	0.40	0.37	0.44	0.41	0.52	0.53	0.45	0.52	0.37	0.45
Safety	0.82	1.07	0.98	0.67	1.65	0.69	0.89	2.00	1.58	0.50	1.13	2.00	1.93	2.00	1.19
Freight	0.88	0.95	0.87	0.81	0.95	0.86	0.95	0.91	0.93	0.83	0.88	0.94	0.95	0.91	0.90

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I-40 Corridor Study: MP 0 to MP 196
Performance Index Summary

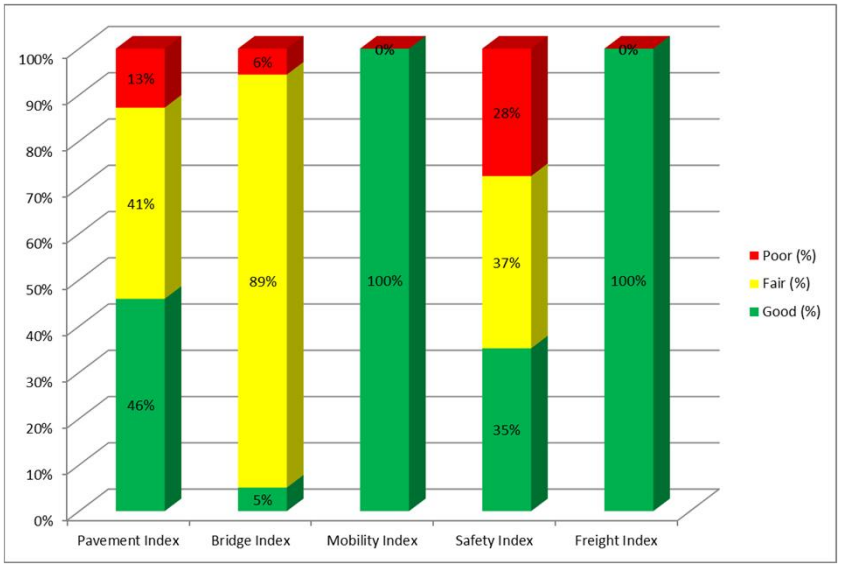
Performance Index Scale

	Pavement	Bridge	Mobility	Safety	Freight
Above Average, Good	> 3.75	> 6.50	<= 0.56 (<= 0.71)	> 1.20 & <= 2.00	> 0.77
Average, Fair	3.20 - 3.75	5.00 - 6.50	0.56 & <= 0.76 (> 0.71 & <= 0.89)	>= 0.80 & <= 1.20	0.67-0.77
Below Average, Poor	< 3.20	< 5.00	> 0.76 (> 0.89)	< 0.80	< 0.67

* Rural Segment (Urban Segment)

Interstate/Highway
Corridor Segment
County Boundary
City Limits

I-40 Corridor Performance Summary



Index Level Summary

% of corridor in each category

	Pavement Performance Area				Bridge Performance Area			Mobility Performance Area										Safety Performance Area			Freight Performance Area				
Segment	Pavement Index	Directional PSR		% Area Failure	Bridge Index	Bridge Sufficiency	% Bridges Functionally Obsolete	Mobility Index	Future Daily V/C	Existing Peak Hour V/C		Closure Extent (instances/ milepost/year/mile)		Directional TTI (all vehicles)		Directional PTI (all vehicles)		% Non-Single Occupancy Vehicle (SOV) Opportunities	Safety Index	% of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors	% of Fatal + Incapacitating Injury Crashes Involving Trucks	Freight Index	Directional TTI (trucks only)		Directional PTI (trucks only)		Closure Duration (hours/ milepost closed/year/ mile)
		EB	WB							EB	WB	EB	WB	EB	WB	EB	WB					EB	WB	EB	WB	
40-1	4.10	4.03	4.12	4.5%	3.66	81.10	5.7%	0.43	0.59	0.26	0.25	0.18	0.09	1.22	1.06	1.34	1.12	9.6%	0.82	70.0%	10.0%	0.88	1.11	1.04	1.20	1.08	1.01
40-2	4.38	4.29	4.21	1.6%	5.62	88.70	6.6%	0.37	0.51	0.16	0.14	0.37	0.09	1.12	1.08	1.19	1.14	14.2%	1.07	62.0%	24.0%	0.95	1.03	1.01	1.07	1.05	3.64
40-3	4.11	4.06	4.04	0.0%	5.84	94.52	25.2%	0.55	0.72	0.37	0.38	0.43	0.22	1.29	1.18	1.48	1.33	19.8%	0.98	37.0%	11.0%	0.87	1.11	1.03	1.22	1.09	3.89
40-4	3.20	3.10	3.48	47.5%	5.59	93.41	24.4%	0.56	0.74	0.28	0.14	0.63	0.27	1.17	1.15	1.26	1.27	18.8%	0.67	20.0%	8.0%	0.81	1.19	1.08	1.31	1.17	6.47
40-5	3.64	4.15	3.20	33.3%	5.13	94.85	21.0%	0.44	0.60	0.24	0.13	1.90	0.90	1.17	1.15	1.26	1.27	15.1%	1.65	25.0%	25.0%	0.95	1.00	1.02	1.03	1.08	21.09
40-6	3.22	3.42	3.22	53.8%	5.36	87.52	3.4%	0.40	0.55	0.21	0.19	1.81	0.91	1.23	1.08	1.38	1.14	6.8%	0.69	36.0%	18.0%	0.86	1.14	1.00	1.29	1.05	20.86
40-7	3.56	3.50	3.57	0.0%	6.72	68.64	0.0%	0.37	0.51	0.17	0.16	1.74	0.82	1.11	1.08	1.17	1.14	6.8%	0.89	20.0%	10.0%	0.95	1.03	1.00	1.07	1.04	19.52
40-8	4.09	4.02	3.98	8.3%	5.71	90.38	49.0%	0.44	0.61	0.21	0.18	1.70	0.85	1.14	1.14	1.21	1.21	15.0%	2.00	23.0%	15.0%	0.91	1.05	1.06	1.08	1.12	19.52
40-9	4.27	3.93	4.24	2.2%	5.21	87.19	0.0%	0.41	0.57	0.19	0.20	1.51	0.70	1.10	1.12	1.16	1.19	12.9%	1.58	35.0%	12.0%	0.93	1.02	1.04	1.07	1.09	15.86
40-10	3.64	3.50	3.55	47.9%	5.37	91.34	40.1%	0.52	0.72	0.22	0.17	1.93	1.25	1.25	1.11	1.41	1.18	13.1%	0.50	44.0%	16.0%	0.83	1.17	1.04	1.32	1.10	21.13
40-11	3.26	3.54	3.63	31.3%	5.81	95.07	23.5%	0.53	0.73	0.24	0.22	1.85	1.13	1.16	1.11	1.25	1.18	8.9%	1.13	75.0%	13.0%	0.88	1.08	1.04	1.17	1.09	20.39
40-12	3.60	3.76	3.94	9.4%	5.27	80.51	79.7%	0.45	0.58	0.21	0.20	1.68	1.08	1.11	1.11	1.17	1.17	9.0%	2.00	33.0%	0.0%	0.94	1.03	1.03	1.06	1.06	18.08
40-13	2.85	3.73	3.52	41.7%	5.50	97.11	0.0%	0.52	0.66	0.29	0.28	1.77	1.13	1.10	1.12	1.15	1.19	14.4%	1.93	25.0%	25.0%	0.95	1.03	1.02	1.07	1.05	15.97
40-14	3.74	3.87	3.75	26.2%	5.11	90.05	0.0%	0.37	0.48	0.24	0.22	1.60	1.13	1.07	1.17	1.14	1.26	16.7%	2.00	0.0%	25.0%	0.91	1.03	1.08	1.06	1.15	14.79
Wtd Avg	3.79	3.79	3.82	20.1%	5.43	88.19	20.2%	0.45	0.61	0.22	0.19	1.24	0.66	1.16	1.11	1.26	1.19	12.9%	1.19	39.2%	14.6%	0.90	1.08	1.03	1.15	1.09	13.21
Good	> 3.75	> 3.75		< 5%	> 6.5	> 80	< 15%	< 0.71 (0.56)		< 0.26				< 1.15		< 1.3		> 17%	> 1.2	< 52 (45)%	< 6 (12)%	> 0.77	< 1.15		< 1.3		< 0.81
Fair	3.2 - 3.75	3.2 - 3.75		5% - 20%	5.0 - 6.5	50 - 80	15% - 45%	0.71 (0.56) - 0.89 (0.76)		0.26 - 1.53				1.15 - 1.33		1.3 - 1.5		11% - 17%	0.8 - 1.2	52 (45)% - 61 (53)%	6 (12)% - 14 (16)%	0.67 - 0.77	1.15 - 1.33		1.3 - 1.5		0.81-18.55
Poor	< 3.2	< 3.2		> 20%	< 5.0	< 50	> 45%	> 0.89 (0.76)		> 1.53				> 1.33		> 1.5		< 11%	< 0.8	> 61 (53)%	> 14 (16) %	< 0.67	> 1.33		> 1.5		>18.55

I-40 Corridor Performance Summary

Pavement

- General performance is “good” or “fair” with exceptions at isolated locations
- Significant pavement failure exists at many isolated locations

Bridge

- General performance is “fair” with exceptions of “good” and “poor” performance at isolated bridges

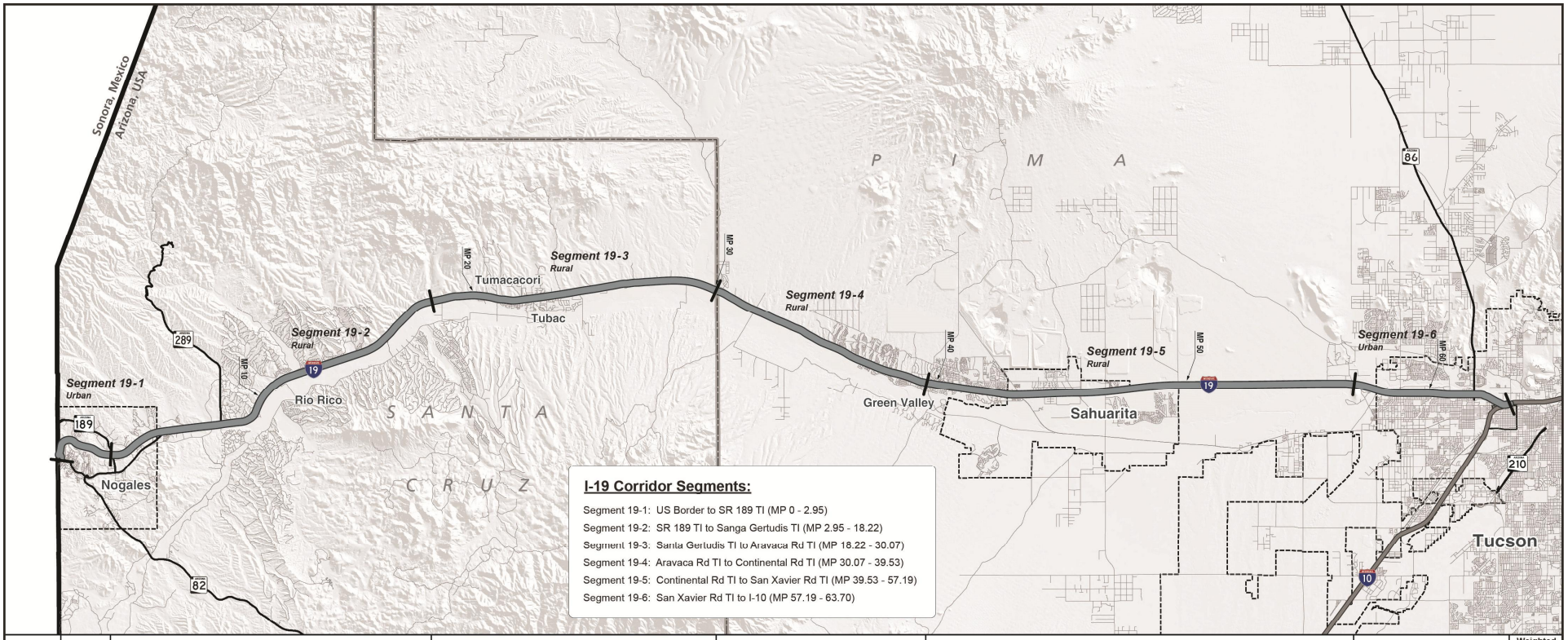
Mobility & Freight

- Currently “good” but projected traffic growth is expected to result in reduced performance in approximately 30% of the corridor by the year 2035
- Eastbound closures exceed the statewide average for the entire corridor

Safety

- Majority of the corridor performs at “fair” or “poor”
- A majority of segments exceed average crashes involving trucks

I-19 Corridor Performance Summary



I-19 Corridor Segments:

Segment 19-1: US Border to SR 189 TI (MP 0 - 2.95)
Segment 19-2: SR 189 TI to Sanga Gertudis TI (MP 2.95 - 18.22)
Segment 19-3: Santa Gertudis TI to Aravaca Rd TI (MP 18.22 - 30.07)
Segment 19-4: Aravaca Rd TI to Continental Rd TI (MP 30.07 - 39.53)
Segment 19-5: Continental Rd TI to San Xavier Rd TI (MP 39.53 - 57.19)
Segment 19-6: San Xavier Rd TI to I-10 (MP 57.19 - 63.70)

	19-1	19-2	19-3	19-4	19-5	19-6	Weighted Average
Pavement	4.03	4.39	3.57	3.54	4.08	3.61	3.87
Bridge	5.98	5.97	6.18	6.60	5.30	6.10	6.02
Mobility	0.23	0.46	0.37	0.40	0.66	1.04	0.53
Safety	0.77	1.13	1.42	1.12	0.95	1.27	1.11
Freight	0.46	0.92	0.34	0.95	0.95	0.89	0.75

I-19 Corridor Profile Study: Nogales to Junction I-10
Performance Index Summary

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PERFORMANCE INDEX SCALE

	Pavement	Bridge	Mobility	Safety	Freight
Above Average, Good	> 3.75	> 6.50	≤ 0.56 (≤ 0.71)	> 1.20 & ≤ 2.00	> 0.77
Average, Fair	3.20 - 3.75	5.00 - 6.50	0.56 & ≤ 0.76 (> 0.71 & ≤ 0.89)	≥ 0.80 & ≤ 1.20	0.67 - 0.77
Below Average, Poor	< 3.20	< 5.00	> 0.76 (> 0.89)	< 3.20	< 0.67

I-19 Corridor Performance Summary

Index Level Summary

% of corridor in each category

	Bridge			Pavement				Mobility											Safety			Freight					
Seg	Bridge Index	Bridge Sufficiency	Obsolete Bridges	Pavement Index	Directional PSR NB	Directional PSR SB	Pavement Failure	Mobility Index	Future V/C	Existing Peak Hour V/C NB	Existing Peak Hour V/C SB	Closure Extent NB	Closure Extent SB	Directional TTI (all vehicles) NB	Directional TTI (all vehicles) SB	Directional PTI (all vehicles) NB	Directional PTI (all vehicles) SB	% Non-SOV	Safety Index	% of Fatal + Incapacitating Injury Crashes Involving SHSP Top 5 Emphasis Areas Behaviors	% of Fatal + Incapacitating Injury Crashes Involving Trucks	Freight Index	Directional TTI (trucks only) NB	Directional TTI (trucks only) SB	Directional PTI (trucks only) NB	Directional PTI (trucks only) SB	Closure Duration
19-1	5.98	90.03	100.0%	4.03	3.72	3.96	16.7%	0.23	0.28	0.17	0.17	0.27	0.27	1.40	1.01	2.28	1.30	14.1%	0.77	66.7%	0.0%	0.46	1.54	1.08	2.37	1.96	0.97
19-2	5.97	89.70	23.3%	4.39	4.28	4.26	3.3%	0.46	0.56	0.28	0.30	0.30	0.20	1.16	1.13	1.25	1.22	16.7%	1.13	68.4%	15.8%	0.92	1.04	1.04	1.09	1.08	1.35
19-3	6.18	93.08	19.7%	3.57	3.74	3.90	0.0%	0.37	0.45	0.21	0.23	0.11	0.19	1.58	1.10	2.50	1.17	14.6%	1.42	50.0%	10.0%	0.34	1.43	1.03	4.91	1.06	1.25
19-4	6.60	95.35	15.7%	3.54	3.76	3.90	0.0%	0.40	0.48	0.27	0.28	0.25	0.20	1.06	1.06	1.08	1.12	15.5%	1.12	61.1%	16.7%	0.95	1.02	1.03	1.05	1.06	0.90
19-5	5.30	90.92	21.3%	4.08	3.97	4.02	0.0%	0.66	0.77	0.51	0.48	0.29	0.23	1.06	1.08	1.11	1.15	13.1%	0.95	43.2%	16.2%	0.95	1.03	1.03	1.05	1.06	1.17
19-6	6.10	77.74	18.8%	3.61	3.54	3.57	18.8%	1.04	1.25	0.90	0.76	0.31	0.34	1.00	1.04	1.03	1.14	15.0%	1.27	61.1%	22.2%	0.89	1.02	1.09	1.06	1.20	4.67
Good	> 6.5	> 80	< 15%	> 3.75	> 3.75		< 5%	Varies	Varies	Varies	Varies	< 0.26		< 1.15		< 1.3		> 17%	> 1.18	Varies	Varies	> 0.77	< 1.15		< 1.3		< 0.81
Fair	5.0-6.5	50-80	15%-45%	3.2-3.75	3.2-3.75		5%-20%	Varies	Varies	Varies	Varies	0.26 – 1.53		1.15 – 1.33		1.3 – 1.5		11%-17%	0.84-1.18	Varies	Varies	0.67-0.77	1.15 – 1.33		1.3 – 1.5		0.81-18.55
Poor	< 5.0	< 50	> 45%	< 3.2	< 3.2		> 20%	Varies	Varies	Varies	Varies	> 1.53		> 1.33		> 1.5		< 11%	< 0.84	Varies	Varies	< 0.67	> 1.33		> 1.5		> 18.55

I-19 Corridor Performance Summary

Pavement

- Generally in “good” or “fair” condition. Segments in the “fair” condition rank in the upper half of that threshold.

Bridge

- Every Segment falls within the “fair” condition threshold except Segment 4, which rates “good”. Three bridges rate below the “poor” threshold – El Toro Road OP, Pima Mine TI, & Santa Cruz River bridge.

Mobility & Freight

- Currently “good” for current and future traffic except for urbanized Segment 6, where is rates “poor” for current and future conditions.
- Travel Time Index is “poor” near the border due to the non-freeway section in Nogales, and in Segment 3 due to the border check point.

Safety

- Majority of the segments perform either “good” or “fair” in the Safety Index, with Segment 1 rating as “poor”
- Several locations of high crash frequency, including 4 segments in the northbound direction, and 3 segments in the southbound direction

Corridor Vision and Objectives

- Describe corridor context and Vision
- Relate statewide goals to performance system
- Establish performance objectives
- Identify Emphasis Areas
- Deficiency = comparison of measured performance to objectives

Corridor Vision and Objectives

ADOT Statewide Long Range Transportation Plan (LRTP) Goals	Performance Area	Corridor Goals
Improve Mobility and Accessibility	Mobility	• Reduce current and future congestion • Reduce delays from non-recurring events and incidents to enhance travel time reliability
	Freight	• Reduce delays and restrictions to freight movements and improve travel time reliability
Preserve and Maintain the State Transportation System	Bridge	• Reduce the number of structurally deficient bridges
	Pavement	• Maintain acceptable level of pavement ride quality
Enhance Safety and Security	Safety	• Reduce fatal and serious injury crashes

I-19 Corridor Vision

- Focus future investments on role as a major freight corridor, including intrastate traffic and international commerce.
- Plan for significant traffic growth, especially in the Tucson area and truck traffic for entire corridor.
- Attain and maintain performance of infrastructure condition, safety, and multimodal opportunities within targeted ranges.
- Emphasis areas include Mobility, Freight, and Safety.

I-19 Corridor Performance Objectives

Performance Measure	Performance Objective	
	Corridor Average	Segment
Bridge Performance Area		
Bridge Index	Fair or better	Fair or better
Bridge Sufficiency Rating		Fair or better
Functionally Obsolete Bridges		Fair or better
Pavement Performance Area		
Pavement Index	Fair or better	Fair or better
Directional Pavement Serviceability		Fair or better
Percent Failure		Fair or better
Mobility Performance Area (Emphasis Area)		
Mobility Index	Good	Fair or better
Existing Directional Peak Hour V/C		Fair or better
Future V/C		Fair or better
Closures		Fair or better
Directional Travel Time Index		Fair or better
Directional Planning Time Index		Fair or better
Non-SOV Trips		Fair or better
Safety Performance Area (Emphasis Area)		
Safety Index	Good	Fair or better
Percent SHSP Emphasis Area Behaviors for Fatal and Serious Injury Crashes		Fair or better
Percent Fatal and Serious Injury Truck Crashes		Fair or better
Percent Fatal and Serious Injury Motorcycle Crashes		Fair or better
Freight Performance Area (Emphasis Area)		
Freight Index	Good	Fair or better
Directional Truck Travel Time Index		Fair or better
Directional Truck Planning Time Index		Fair or better
Closures		Fair or better

I-17 Corridor Vision

Interstate-17 (I-17) from SR 101L to I-40 is and will continue to be a major transportation corridor for commuting, commerce, and tourism. ADOT has designated this section of I-17 as a Key Commerce Corridor and as part of the National Primary Freight Network. The Vision for the I-17 corridor contains the following key points:

- Meet goals and vision of ADOT Long-Range Transportation Plan and bqAZ
- Enhance safety
- Maintain and preserve highway infrastructure
- Provide reliable route for recreational and tourist travel to/from Northern Arizona
- Provide efficient commuting route between Metro Phoenix area and Northern Maricopa County and Central Yavapai County
- Provide efficient commuting route between Southern Coconino County and Flagstaff
- Provide reliable route for freight connection between I-10 and I-40
- Provide efficient commuting route between Verde Valley and the surrounding communities of Sedona, Prescott Valley, and Flagstaff

I-17 Corridor Performance Objectives

Performance Measure	Performance Objective	
	Corridor Average	Segment
Bridge Performance Area		
Bridge Index	Fair or better	Fair or better
Bridge Sufficiency Rating		Fair or better
Functionally Obsolete Bridges		Fair or better
Pavement Performance Area		
Pavement Index	Fair or better	Fair or better
Directional Pavement Serviceability		Fair or better
Percent Failure		Fair or better
Mobility Performance Area (Emphasis Area)		
Mobility Index	Good	Fair or better
Existing Directional Peak Hour V/C		Fair or better
Future V/C		Fair or better
Closures		Fair or better
Directional Travel Time Index		Fair or better
Directional Planning Time Index		Fair or better
Non-SOV Trips		Fair or better
Safety Performance Area (Emphasis Area)		
Safety Index	Good	Fair or better
Percent SHSP Emphasis Area Behaviors for Fatal and Serious Injury Crashes		Fair or better
Percent Fatal and Serious Injury Truck Crashes		Fair or better
Percent Fatal and Serious Injury Motorcycle Crashes		Fair or better
Freight Performance Area		
Freight Index	Fair or Better	Fair or better
Directional Truck Travel Time Index		Fair or better
Directional Truck Planning Time Index		Fair or better
Closures		Fair or better

I-40 Corridor Vision

I-40 from the Arizona/California State Line to Junction I-17 is and will continue to be a major transportation corridor for intrastate and interstate commerce, intercity travel, and tourism. I-40 is designated by ADOT as a strategic highway corridor, a key commerce corridor, and part of the National Primary Freight Network. The Vision for the I-40 corridor contains the following key points:

- Meet goals and vision of the ADOT Long-Range Transportation Plan and bqAZ
- Enhance safe and reliable movement of people, vehicles, and goods
- Maintain and preserve corridor infrastructure including pavement and bridges
- Provide reliable route for recreational and tourist travel in Northern Arizona
- Within urbanized areas serve daily commuters and intrastate/interstate travel in and through the urbanized areas
- Provide reliable route for freight travel through the state
- Enhance highway capacity, safety, and multimodal opportunities as urbanized areas grow

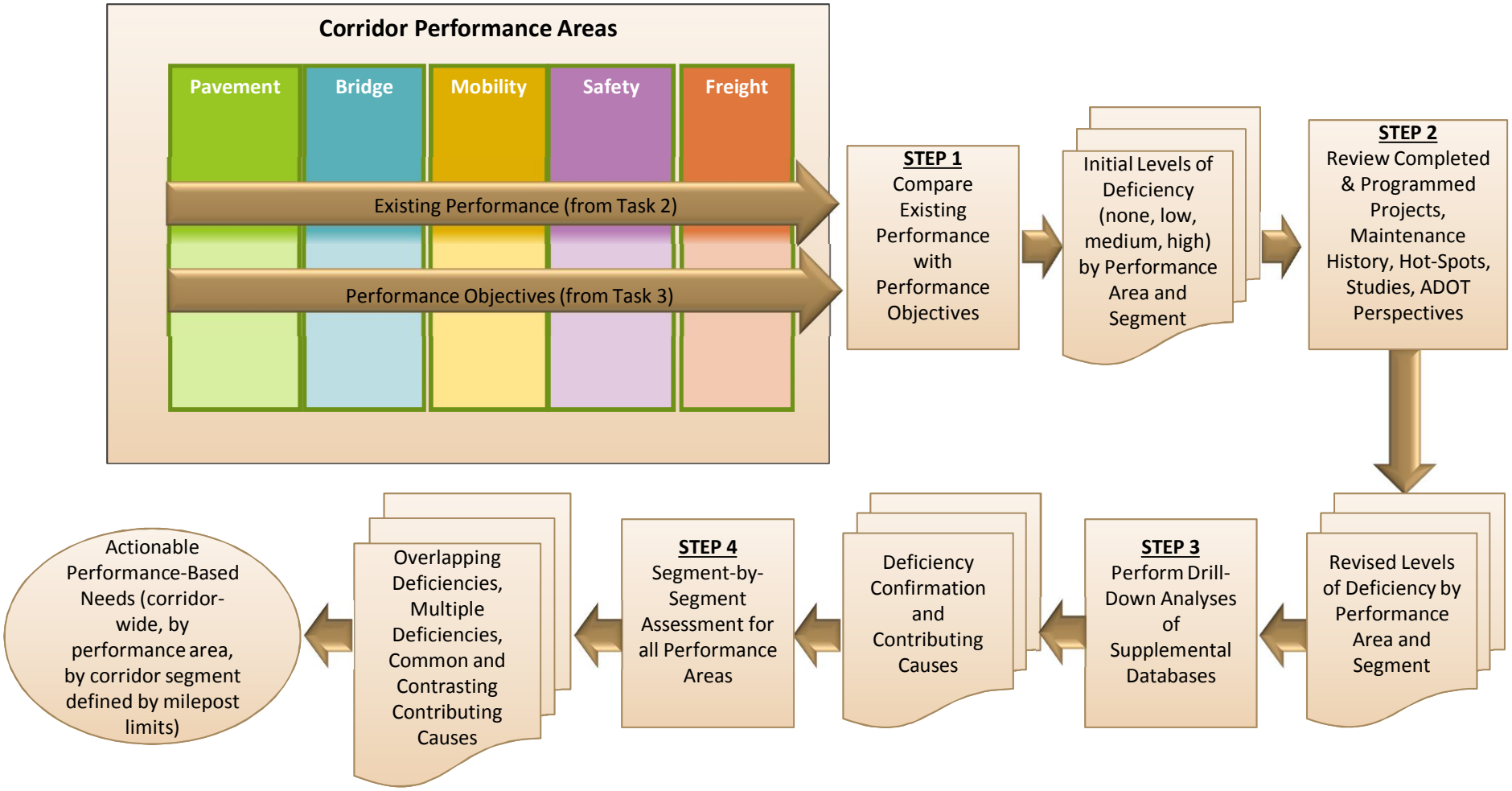
I-40 Corridor Performance Objectives

Performance Measure	Performance Objective	
	Corridor Average	Segment
Bridge Performance Area (Emphasis Area)		
Bridge Index	Good	Fair or better
Bridge Sufficiency Rating		Fair or better
Functionally Obsolete Bridges		Fair or better
Pavement Performance Area (Emphasis Area)		
Pavement Index	Good	Fair or better
Directional Pavement Serviceability		Fair or better
Percent Failure		Fair or better
Mobility Performance Area		
Mobility Index	Good	Fair or better
Existing Directional Peak Hour V/C		Fair or better
Future V/C		Fair or better
Closures		Fair or better
Directional Travel Time Index		Fair or better
Directional Planning Time Index		Fair or better
Non-SOV Trips		Fair or better
Safety Performance Area (Emphasis Area)		
Safety Index	Good	Fair or better
Percent SHSP Emphasis Area Behaviors for Fatal and Serious Injury Crashes		Fair or better
Percent Fatal and Serious Injury Truck Crashes		Fair or better
Percent Fatal and Serious Injury Motorcycle Crashes		Fair or better
Freight Performance Area		
Freight Index	Good	Fair or better
Directional Truck Travel Time Index		Fair or better
Directional Truck Planning Time Index		Fair or better
Closures		Fair or better

Approach to Needs Assessment

- Based on Performance System
- Multi-step Process
- Deficiency = comparison of measured performance to objectives
- Need = deficiency that has been verified and is actionable
- Identify Contributing Factors

Approach to Needs Assessment



Example Initial Deficiency Assessment (Step 1)

Pavement Performance Area for I-40

Segment	Segment Length (miles)	Pavement Index			Directional PSR					% Pavement Failure			Performance Deficiency
		Performance Score	Performance Objective	Level of Deficiency	Performance Score		Performance Objective	Level of Deficiency		Performance Score	Performance Objective	Level of Deficiency	
					NB	SB		NB	SB				
40-1	11	4.10	Fair or Better	None	4.03	4.12	Fair or Better	None	None	4.5%	Fair or Better	None	None
40-2	32	4.38	Fair or Better	None	4.29	4.21	Fair or Better	None	None	1.6%	Fair or Better	None	None
40-3	12	4.11	Fair or Better	None	4.06	4.04	Fair or Better	None	None	0.0%	Fair or Better	None	None
40-4	19	3.20	Fair or Better	Medium	3.10	3.48	Fair or Better	Medium	Low	47.5%	Fair or Better	High	High
40-5	6	3.64	Fair or Better	None	4.15	3.20	Fair or Better	None	Medium	33.3%	Fair or Better	High	Low
40-6	18	3.22	Fair or Better	Medium	3.42	3.22	Fair or Better	Low	Medium	53.8%	Fair or Better	High	High
40-7	10	3.56	Fair or Better	Low	3.50	3.57	Fair or Better	Low	None	0.0%	Fair or Better	None	Low
40-8	12	4.09	Fair or Better	None	4.02	3.98	Fair or Better	None	None	8.3%	Fair or Better	None	None
40-9	23	4.27	Fair or Better	None	3.93	4.24	Fair or Better	None	None	2.2%	Fair or Better	None	None
40-10	17	3.64	Fair or Better	None	3.50	3.55	Fair or Better	Low	Low	47.9%	Fair or Better	High	Low
40-11	8	3.26	Fair or Better	Medium	3.54	3.63	Fair or Better	Low	None	31.3%	Fair or Better	High	High
40-12	16	3.60	Fair or Better	None	3.76	3.94	Fair or Better	None	None	9.4%	Fair or Better	None	None
40-13	6	2.85	Fair or Better	High	3.73	3.52	Fair or Better	None	Low	41.7%	Fair or Better	High	High
40-14	6	3.74	Fair or Better	None	3.87	3.75	Fair or Better	None	None	26.2%	Fair or Better	High	Low
Weighted Average		3.79	Good	None									

Example Initial Deficiency Refinement (Step 2)

Pavement Performance Area for I-40

Segment	Segment Length (miles)	Initial Deficiency from Performance Results	Hot Spots	Historical Investment	Previous Projects	Programmed Projects	Resulting Deficiency
40-1	11	None	1 mile EB	Low	Previous projects in 2011-2012		None
40-2	32	None		High	Previous projects in 2011-2012		None
40-3	12	None		Medium	Previous projects in 2008 - 2010		None
40-4	19	High	14 miles EB, 4 miles WB	Low	Previous projects in 2008	2 miles RR- -TL, PL, S (FY 2016)	High
40-5	6	Low	4 miles WB	Medium	Previous projects in 2011	6 miles RR-TL, PL, S (FY 2016)	Medium
40-6	18	High	6 miles EB, 11 miles WB	Medium	Previous project in 2011, Reconstruction in 2003	1 mile RR-TL, PL, S (FY 2016)	High
40-7	10	Low	2 miles NB & 1 mile SB	Medium	Previous project in 1999, 2008	12 miles RR-TL, PL (FY 2016)	Medium
40-8	12	None	1 mile EB	Medium	Previous project in 1999, 2008	10 miles RR-TL, PL (FY 2016)	None
40-9	23	None		Medium	Previous project in 2011, 2013		None
40-10	17	Low	5 miles EB, 7 miles WB	High	Previous projects in 1995 -2009 with reconstruction in 2003		High
40-11	8	High	3 miles EB, 1 mile WB	Medium	Previous projects in 1999 - 2012	2 miles RR-TL, PL (FY 2017)	High
40-12	16	None	3 miles EB, 3 miles WB	High	Previous projects in 2008 - 2013	11 miles RR-TL, PL (FY 2017/2018)	Medium
40-13	6	High	4 miles EB, 2 miles WB	Medium	Previous projects in 2008	4 miles RR-TL, PL (FY 2018)	High
40-14	6	Low	1 mile EB, 2 miles WB	Medium	Previous projects in 2008 - 2010	8 miles RR-TL, PL (2018)	Medium
Weighted Average		None					

Next Steps

- WP #2 and WP #3 review comments
- Perform Needs Assessment and Distribute WP #4
- Solution Set Workshops